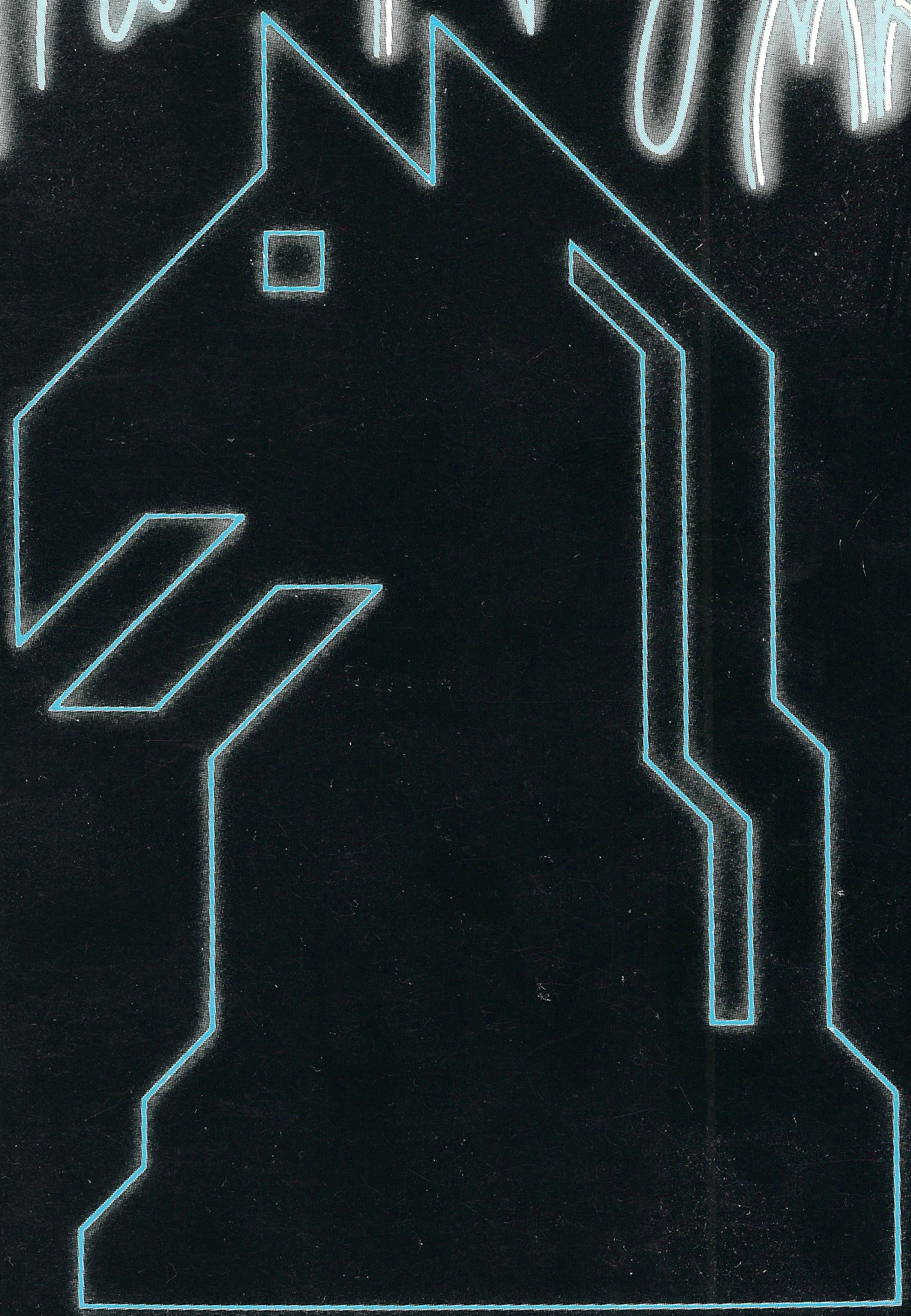
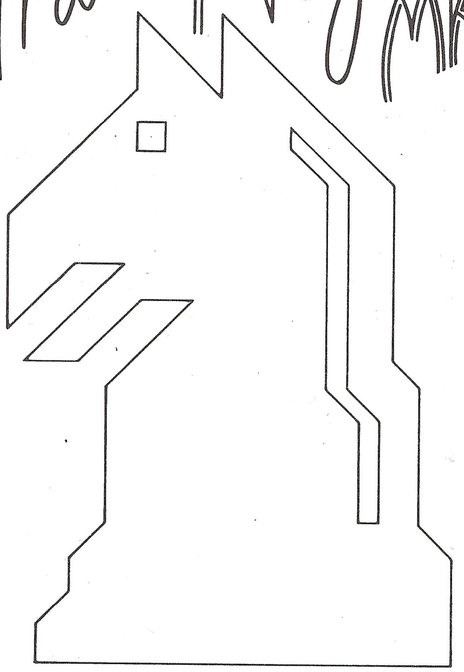
White Knight Mk II



The Chess Master

BRITISH BROADCASTING CORPORATION
BROADCASTING SOFT

White Knight MK11



The chess playing program for the
Model B Microcomputer

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CONTENTS

	Running the program	**5**
1	**Display**	**5**
a	The board	5
b	The player names	5
c	The clocks	5
d	The moves	5
e	Various messages and questions	6
f	Colours	6
2	**Playing a game**	**6**
a	New game	6
b	Your move	6
c	White-Knight's move	7
d	Game over	7
e	'Exiting' the program	7
3	**Keyboard entries**	**7**
a	Cursor movement	7
b	Numeric data	8
c	Commands	8

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RUNNING THE PROGRAM

Make sure that the tape is wound to its beginning. Type in CHAIN 'TITLE' and press RETURN; and then press the Play button on your tape recorder if it is not motor controlled. TITLE displays the Owl logo and then chains the next program, CHESS. CHESS displays a Knight piece and in turn chains the main program. If you prefer, you can instead carry out the above sequence using CHAIN "CHESS" to get to White-Knight sooner. Make sure also (if the recorder is not motor controlled) that you stop the tape when White-Knight has been chained. A short 'beep' and the chess board displayed onscreen will indicate this.

1 THE DISPLAY

a The board

A graphics board printout displays the current position. Letters and numbers around the board indicate the algebraic notation used for each square.

b The player names

Above and below the board are displayed the names of the white and black players. The program's name is displayed as 'White-Knight (Mk 11)' while its opponent's name is displayed as 'Opponent'.

c The clocks

Above and below the board are displayed the elapsed-time clocks for white and black. The clocks are in the format 'hh:mm:ss' (hh = hours, mm = minutes, ss = seconds). The clocks show the total time used by each side in the game so far.

d The moves

Below the board is displayed the current move number and the corresponding move by each side. The moves are displayed in algebraic notation with the 'from-square' followed by the 'to-square'. The separator between the from- and to-squares indicates whether the move is a capture or not ('x' signifies a capture, '–' signifies a non-capture). Castling moves are indicated with the from- and to-squares of the moving king. En-passant captures have no special indication. Promotions are indicated after the move by a '/', followed by a letter to indicate the promoted piece ('N' = knight, 'B' = bishop, 'R' = rook, 'Q' = queen). Checks are indicated by a '+' being printed after the move.

e Various messages and questions

Various messages and questions are displayed below the move printout as necessary. These are explained in more detail in later sections.

f Colours

The BASIC loader program, CHESS, contains two VDU 19 statements at line 20. You can change these (first LOAD "CHESS", then LIST) to select the foreground and background colours you find best for your display equipment. The default colours are cyan foreground on a black background. (See page 382 of the Micro User Guide for more details on VDU 19.)

2 PLAYING A GAME

a New game

When a new game is started, the pieces are set up in their initial positions, the clocks are reset to '00:00:00', the move display is cleared, the white clock is started, and you are given the option of moving first. Pressing 'E' will make the program take the white pieces and move first (for further details see the 'Exchange' command described later).

b Your move

Whenever it is your turn to move, the program asks 'Your move?' at the bottom of the screen. You enter moves by the following cursor positioning method (see the later section, *Cursor movement*, for further details).

(i) Move the cursor to the square of the piece you wish to move, and press the RETURN key. This causes the from-square to be displayed. If you accidentally enter the wrong from-square, your entry can be cancelled by pressing the DELETE key.

(ii) Move the cursor to the square you wish to move to and again press RETURN. This causes the to-square to be displayed. If the move is illegal, the message 'Illegal' is displayed and the move entry cleared. You must then return to step 1 above and try again.

(iii) If the move is a pawn promotion the program then asks 'Promotion piece?' You must then specify the piece you want to promote to by typing one of the following: 'N'-knight, 'B'-bishop, 'R'-rook or 'Q'-queen. If you press any other key, the program assumes you promote to a queen.

The legal move is now indicated on the board by flashing the cursor on the from-square and then moving the piece and flashing the cursor on the to-square.

c White-Knight's move

When the program thinks about its move, it displays the lookahead depth of its search, below the printout. The depth is printed in 'ply' or 'half-moves'. The program will search most move sequences to at least this depth, with some being searched much deeper. Also, to the right of the board, it displays the best line it has found so far in its search. This can provide you with a 'hint' move and an analysis of the game in the next few moves. (Usually the line will contain a 'null' move. This simply means a passive, non-capturing move). When the program has finished its search, it prints the selected move and indicates it on the board (in the same way as your moves are indicated), and displays the number of positions it examined during the search. Pressing any key, whilst the program is thinking about its move, will cause it to abort its search, display the message 'Escape' and make the best move it has found so far. If the program has found that its move leads to checkmate, it announces the move with the message 'Mate in N' where N is the number of moves till the mate.

d Game over

When a game is completed, the clocks are stopped and the program displays a message, below the move printout, to indicate the final state of the game. The messages are:

'Drawn'	– The game has been drawn by 3-fold repetition of position or the 50-move rule.
'Checkmate'	– the side which moved last delivered checkmate.
'Stalemate'	– the side to move is in stalemate.

The program then asks 'What now?' and waits for you to enter one of the program commands. Press CTRL and 'N' to start a new game (for further details see the 'New-game' command described later).

e 'Exiting' the program

Because White-Knight uses part of the machine's operating system, it is advised that you do not exit the program by pressing the BREAK key, but always turn the power off.

3 KEYBOARD ENTRIES

a Cursor movement

The cursor is indicated by an inverse line drawn through the middle of the current square. It can be moved in two ways.

(i) The four cursor control keys provide single-square movement in any direction. If the cursor is moved off the edge of the board, it reappears at the opposite edge.
(ii) The *lowercase* letters 'a' to 'h' and numbers '1' to '8' can be typed to move the cursor instantly to the required file or rank. This allows algebraic notation to be used when entering moves. For example, if you wish to move a piece from square D2 to D4, first make sure the CAPS LOCK light of the computer is *off*, then type D2 and press RETURN and follow this by typing D4 and then pressing RETURN.

The initial position of the cursor depends on the current side to move.
If white is to move, the cursor starts on square A1.
If black is to move, the cursor starts on square A8.

b Numeric data

Many of the program's commands require numbers to be entered to setup new values for what the program expects (its 'parameters') so as to carry out a particular function. The program employs a simple-to-use method for entering numbers. First the current value of the parameter is displayed at the cursor position. To increment the displayed value use the up-arrow key. If the new value is above the upper limit for that parameter then it moves back to its lower limit. To decrement the displayed value use the down-arrow key. If the new value is below the lower limit for that parameter then it moves back to its upper limit. To enter the new value into the program, press RETURN. (If you do not wish to change the current value, just press RETURN instead of using the up-arrow or the down-arrow keys).

c Commands

The following commands can be entered when it is your turn to move or when the game is over. To enter a command, just type its first letter. Please make sure that the CAPS LOCK light is *on* when you want to use these commands.

Note: The clocks are paused while a command is processed.

***ALTER-POSITION* – Type 'A'**
Any legal chess position can be setup with this command. When selected, the program displays the message:
'Alter position: SSSSS: Command?' (where SSSSS is the side to move). When in 'Alter-position' mode, a further subset of commands allow you to adjust the board (after first typing 'A'):

***Side-to-move* – Type 'S'**
This toggles the side to move between white and black. When pieces are added to the board, their colour is determined by the current side to move.

***Clear, Pawn, Knight, Bishop, Rook, Queen, King* – Type 'C', 'P', 'N', 'B', 'R', 'Q', 'K'**
To change a particular square, place the cursor over it and enter one of above, to determine the new status of that square. Type 'C' for Clear; 'P' for Pawn; 'N' for Knight; 'B' for Bishop; 'R' for Rook; 'Q' for Queen; 'K' for King.

***Move-number* – Type 'M'**
The program asks 'Move number?' thus allowing you to enter the new move number required. (See section 3b for more details on how to enter numeric data).

***Invisible, New-game, Orientation* – Type 'I', 'N' or 'O'**
The 'Invisible', 'New-game' and 'Orientation' commands are *still available* when in 'Alter-position' mode. (See full descriptions below).

***Wipe* – Type 'W'**
This removes all pieces from the board, thus allowing positions with very few pieces to be setup more quickly.

***Exit* – Type 'E'**
This allows you to exit from 'Alter-position', when the required position has been achieved. If the position is illegal for any reason, the message 'Illegal' is displayed and 'Alter-position' will not be exited. You must then correct the error before exiting, or start a new game.
Illegal positions occur with any of the following:
(i) either side has no king
(ii) either side has more than one king
(iii) the side not to move is in check
(iv) either side has a pawn on the first or eighth rank
(v) either side has more than eight pawns or promoted pieces

***'Back-step' and 'Fore-step'* – Type 'B' or 'F'**
All the moves in the game are stored in the program's memory (but see the Note below). These commands allow you to step backwards or forwards through the game record, to get to any required position.
This can be used for several reasons, for example:
(i) after you accidentally leave a piece en-prise you can recover your error by using Back-step.
(ii) if you wish to replay the game so far, for someone else to see, you can use New-game followed by repeated Fore-steps.
(iii) if you wish to try a different line earlier in the game, you can Back-step to the required position and then carry on playing the different line.

Note: In fact, the program only has room in memory for about the most recent 120 moves. This should be enough to store most games completely. If, however, the game goes on for more than 120 moves, the game record is automatically updated to store the most recent 120. You cannot then Back-step right to the beginning of the game.

***Clocks* – Type 'C'**
The elapsed-time clocks for both sides can be set from 00:00:00 to 99:59:59. First the program asks for the new value for the white clock and then the new value for the black clock. This can be used to setup reasonable values for the elapsed-time clocks, if you change the playing speed in mid-game.

This is a situation where section 3b, which is on how to input numbers for parameters, applies.

***Exchange* – Type 'E'**
This allows you to change sides with the program. It in effect makes the program play for the current side to move. This can be used repeatedly to make the program play several moves against itself or to force the program to resume play, for the side to move, if the 'Supervisor' command has been entered. This command makes the program play *white*, after a new game has *been started*. It is ignored if the game is over.

***Invisible* – Type 'I'**
This allows you (if you feel confident enough) to play the equivalent of a game of 'blindfold' chess, as is sometimes done by strong chess players. The pieces displayed on the board are made invisible. The moves are still indicated on the board and displayed in the normal notation beneath it. Using this command *again* will make the pieces visible once more. When 'Invisible' is selected, the word 'Invisible' appears at the top right of the board, to inform you of the mode you are playing in.

***Mode* – Type 'M'**
The program has four modes of play, to allow different speed and style games to be selected. **The more time you give the program to think about its move, the better it will play.** The program asks 'Mode?', to allow you to select one of the following (after typing 'M').

(i) ***Equality* – Enter '1' using the up- and down-arrow keys**
In this mode, the program will attempt to keep its elapsed-time clock closely matched to your elapsed-time clock, effectively playing at a similar speed to yours. If you make several quick moves, the program will also probably have to play quickly to keep up with the 'pace' you are setting. If, however, you think for a long time over some moves, the program will also be able to think longer over its moves. In practice, the program's clock will usually trail yours by a few minutes.

(ii) ***Problem* – Enter '2' using the up- and down-arrow keys**
This mode is used to solve chess mating problems.
When selected the program asks 'Mate in?' whereupon you must enter the number of moves till the intended mate. The clocks are set to 00:00:00 when the program starts searching for the mate, so that the time to find the mate can be recorded. If the program finds a mating move, it prints the mating line to the right of the board, stops the clocks, and asks 'Continue?'. If you are satisfied with the discovered move, then pressing 'N' will cause the program to make this move immediately. If, however, you wish the program to continue searching for any alternative mate, press 'Y' and the program will restart the clocks and continue searching for another mate. This process is repeated until no more mating moves are found, in which case the program will then make the last mating move it has found. If the program does not find any mate, the message 'No mate' is displayed and the program automatically enters 'Alter-position' to allow you to select another position or correct the current one. White-Knight (Mk 11) is probably the fastest problem-solving microcomputer chess program in the world.

(iii) ***Tournament* – Enter '3' using the up- and down-arrow keys**
Full tournament parameters can be setup.
First, the program asks for the move number of the first time control.
Second, the program asks for the number of moves to secondary time controls.
Third, the program asks for the time of the first time control.
Fourth, the program asks for the time to the secondary time controls.
The program is not strict about your time control and will not claim a win 'on time', if you exceed any time control. The program will usually not exceed its own time control.

(iv) ***Average* – Enter '4' using the up- and down-arrow keys**
This is really an easily used version of Tournament mode. Instead of entering all four parameters needed for tournament mode, the program simply asks you 'Move time?'. The program will then control its search to use, on average, the time you enter. (Entering 0 seconds for the average move time, selects the program's fastest level). This effectively provides thousands of 'levels' of play!

Note 1: In fact, this mode sets up tournament parameters of 60 moves to each time control, with 60 times the average move-time being allocated for each

control. The default mode is 4 (Average mode), with an average of 10 seconds per move.

Note 2: Once again, if you want to refresh your memory on how to alter the numbers you have to enter, refer to Section 3b.

***New-game* – Press the CONTROL key; type 'N'**

Start a new game with this command. Because of the destructive nature of this command it *must* be entered with the CTRL key also pressed. This stops any accidental key press from destroying the current game. If you have not used 'Alter-position' since the last 'New-game', then the game record is left intact until the first move of the new game is entered. This allows you to replay through the whole of the last game, by using repeated 'Fore-steps'.

***Orientation* – Type 'O'**

The orientation of the board printout can be reversed, so that you can play the black pieces up the board. The algebraic notation around the board, the player names, and the elapsed-time clocks are also reversed.
This is most useful when you wish to play black against the program!

***Play-self* – Type 'P'**

The program plays a game against itself, by moving for both sides. When a game is completed, the program pauses for a few seconds to allow you to study the final position, and then starts a new game automatically. This command is ignored if the program is in problem mode or the game is over. Pressing any key, whilst the program is thinking about its move (but not while it is indicating its move on the board) or after the game is over, will stop the program playing itself and allow you to resume play for the current side to move. When playing itself, both player names are displayed as 'White-Knight (Mk 11)'.

***Supervisor* – Type 'S'**

This stops the program making any moves, and allows you to play moves for both sides. This allows you to setup a required position by playing through a sequence of moves for both sides, or to play a friend using the program's board display. All moves entered are still checked for legality. When supervising, both player names are displayed as 'Opponent'.

***Volume* – Type 'V'**

The volume of the program's 'beep' can be adjusted from 0 (silent) to 15 (loudest).

White-Knight offers a large number of facilities and at first you may be spoilt for choice. The commands you will most often use are:
New Game
Mode 4
Exchange
Orientation.

E1 – G1 = CASTLE